PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 30 June 2000 (30.06.00)	
International application No. PCT/CA99/01013	**Applicant's or agent's file reference** 13693-7pctJA
International filing date (day/month/year) 29 October 1999 (29.10.99)	**Priority date** (day/month/year) 30 October 1998 (30.10.98)
Applicant MOINEAU, Gilbert et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

29 May 2000 (29.05.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer C. Villet
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/331 (July 1992)

CA9901013

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WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : H04L 29/12, 12/24

A1

(11) International Publication Number: WO 00/27093

(43) International Publication Date: 11 May 2000 (11.05.00)

(21) International Application Number: PCT/CA99/01013

(22) International Filing Date: 29 October 1999 (29.10.99)

(30) Priority Data:
2,252,207 30 October 1998 (30.10.98) CA

(71) Applicants *(for all designated States except US)*: EICON TECHNOLOGY CORPORATION [CA/CA]; 9800 Cavendish Boulevard, Montréal, Québec H4M 2V9 (CA). EICON TECHNOLOGY MANUFACTURING EUROPE LIMITED [IE/IE]; Unit 7, Sandyford Park, Sandyford Industrial Estates, 18 Dublin (IE).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: MOINEAU, Gilbert [CA/CA]; 3255 Dalbé-Viau, Lachine, Québec H8T 3N3 (CA). MAHER, Tom [IE/IE]; 4 Glencairn Chase, 18 Dublin (IE). O'HARA, Daniel [IE/IE]; 44 Auburn Drive, Castleknock, 15 Dublin (IE).

(74) Agents: ANGLEHART, James et al.; Swabey Ogilvy Renault, Suite 1600, 1981 McGill College Avenue, Montréal, Québec H3A 2Y3 (CA).

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published

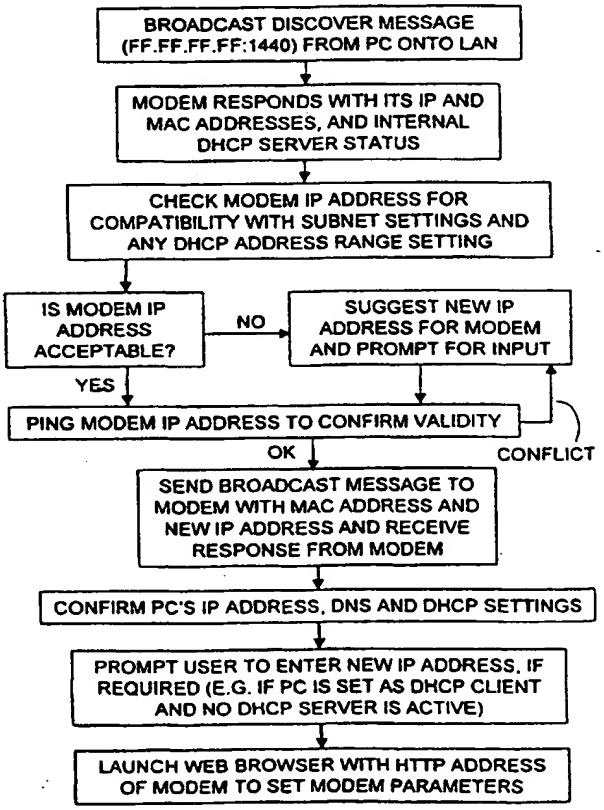
With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: DIGITAL NETWORK MODEM AND CONFIGURATION SYSTEM FOR A DIGITAL NETWORK MODEM

(57) Abstract

A network modem has an initialization control module for setting its static local network address remotely via the local network in response to a request by a configuration station. The configuration station sends a request on the local network to the modem to obtain identification and a static IP address from the modem, receives a response from the modem and displays the static IP address, accepts user input to set said static IP address, and sends a request on the local network to the modem to set said static address. The system allows a user to set the static IP address for the modem, configure the modem settings, as well as the settings for the station. The system is easy to use and can work even if initial modem and configuration station communications parameters are incompatible.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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EE	Estonia	**LR**	Liberia	**SG**	Singapore		

INTERNATIONAL SEARCH REPORT

Intern. onal Application No
PCT/CA 99/01013

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/12 H04L12/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	LOUCKS W M ET AL: "IMPLEMENTATION OF A DYNAMIC ADDRESS ASSIGNMENT PROTOCOL IN A LOCAL AREA NETWORK" COMPUTER NETWORKS AND ISDN SYSTEMS,NL,NORTH HOLLAND PUBLISHING. AMSTERDAM, vol. 11, no. 2, February 1986 (1986-02), pages 133-146, XP000811184 ISSN: 0169-7552	1-3,6,7, 20,21
A	page 133, right-hand column, line 1 -page 137, left-hand column, line 9 page 141, right-hand column, line 44 -page 143, left-hand column, line 12	11

-/—

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 March 2000	24/03/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	Lievens, K

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Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 98 26548 A (WHISTLE COMMUNICATIONS CORP ;COBBS ARCHIE L (US); LI JIM Y (US); O) 18 June 1998 (1998-06-18)	1-3,6,7, 20,21
A	abstract page 1, line 27 -page 4, line 32 page 6, line 12-15 page 7, line 17 -page 10, line 30 page 11, line 32 -page 12, line 11 page 15, line 17-23 page 17, line 18 -page 20, line 32 figure 6	4,18
A	GOPAL I S ET AL: "DYNAMIC ADDRESS ASSIGNMENT PROTOCOLS" PROCEEDINGS. IEEE INFOCOM, THE CONFERENCE ON COMPUTER COMMUNICATIONS. ANNUAL JOINT CONFERENCE OF THE IEEE COMPUTER AND COMMUNICATIONS SOCIETIES. GATEWAY TO THE 21ST CENTURY,April 1984 (1984-04), XP000811928 page 120, left-hand column, line 1 -page 121, left-hand column, line 29 page 122, right-hand column, line 11-27 figure 2	1,11,20, 21
A	B. CROFT, J. GILMORE: "Bootstrap protocol (BOOTP)" REQUEST FOR COMMENT, 'Online! September 1985 (1985-09), XP002132750 Retrieved from the Internet: <URL:http://www.faqs.org/rfcs/rfc951.html> 'retrieved on 2000-03-10! page 1, line 1 -page 4, line 21 page 5, line 1-25	1,11,20, 21

1

INTERNATIONAL SEARCH REPORT

information on patent family members

Inte onal Application No
PCT/CA 99/01013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9826548 A	18-06-1998	US 6012088 A	04-01-2000
		AU 3572697 A	03-07-1998
		EP 0953248 A	03-11-1999

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
13693-7pctJA		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/CA 99/ 01013	29/10/1999	30/10/1998
Applicant		
EICON TECHNOLOGY CORPORATION et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2

   [X] as suggested by the applicant.

   [ ] None of the figures.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International Application No
PC[redacted] 99/01013

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/12 H04L12/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	LOUCKS W M ET AL: "IMPLEMENTATION OF A DYNAMIC ADDRESS ASSIGNMENT PROTOCOL IN A LOCAL AREA NETWORK" COMPUTER NETWORKS AND ISDN SYSTEMS,NL,NORTH HOLLAND PUBLISHING. AMSTERDAM, vol. 11, no. 2, February 1986 (1986-02), pages 133-146, XP000811184 ISSN: 0169-7552	1-3,6,7, 20,21
A	page 133, right-hand column, line 1 -page 137, left-hand column, line 9 page 141, right-hand column, line 44 -page 143, left-hand column, line 12	11

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 March 2000	24/03/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Lievens, K

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PC[redacted] 99/01013

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 98 26548 A (WHISTLE COMMUNICATIONS CORP ;COBBS ARCHIE L (US); LI JIM Y (US); O) 18 June 1998 (1998-06-18)	1-3,6,7, 20,21
A	abstract page 1, line 27 -page 4, line 32 page 6, line 12-15 page 7, line 17 -page 10, line 30 page 11, line 32 -page 12, line 11 page 15, line 17-23 page 17, line 18 -page 20, line 32 figure 6	4,18

A	GOPAL I S ET AL: "DYNAMIC ADDRESS ASSIGNMENT PROTOCOLS" PROCEEDINGS. IEEE INFOCOM, THE CONFERENCE ON COMPUTER COMMUNICATIONS. ANNUAL JOINT CONFERENCE OF THE IEEE COMPUTER AND COMMUNICATIONS SOCIETIES. GATEWAY TO THE 21ST CENTURY,April 1984 (1984-04), XP000811928 page 120, left-hand column, line 1 -page 121, left-hand column, line 29 page 122, right-hand column, line 11-27 figure 2	1,11,20, 21

A	B. CROFT, J. GILMORE: "Bootstrap protocol (BOOTP)" REQUEST FOR COMMENT, 'Online! September 1985 (1985-09), XP002132750 Retrieved from the Internet: <URL:http://www.faqs.org/rfcs/rfc951.html> 'retrieved on 2000-03-10! page 1, line 1 -page 4, line 21 page 5, line 1-25	1,11,20, 21

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 99/01013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9826548 A	18-06-1998	US 6012088 A	04-01-2000
		AU 3572697 A	03-07-1998
		EP 0953248 A	03-11-1999

PATENT COOPERATION TREATY

Fax No. 514-288-8389

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

SWABEY OGILVY RENAULT
MCGILL COLLEGE
RECEIVED
FEB 5 2001
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

PCT – 16 pages

To:

SWABEY OGILVY RENAULT
1981 McGill College Avenue
Suite 1600
Montréal, Québec H3A 2Y3
CANADA

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Confirmation
FAX-Bestätigung

Date of mailing *(day/month/year)*	25. 01. 01
Applicant's or agent's file reference 13693-7pctJA	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CA99/01013	29/10/1999	30/10/1998

Applicant
EICON TECHNOLOGY CORPORATION et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Ahrens, R Tel.+49 89 2399-8136

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
13693-7pctJA		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CA99/01013	29/10/1999	30/10/1998
International Patent Classification (IPC) or national classification and IPC H04L29/12		
Applicant EICON TECHNOLOGY CORPORATION et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 7 sheets.

3. This report contains indications relating to the following items:

I	☒	Basis of the report
II	☐	Priority
III	☒	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	☐	Lack of unity of invention
V	☒	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
VI	☐	Certain documents cited
VII	☒	Certain defects in the international application
VIII	☒	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
29/05/2000	25. 01. 01
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ferrari, J Telephone No. +49 89 2399 8803

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA99/01013

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:
Description, pages:

1,2,6-9	as originally filed			
3-5	as received on	05/01/2001	with letter of	04/01/2001

Claims, No.:

1-21	as received on	05/01/2001	with letter of	04/01/2001

Drawings, sheets:

1/2,2/2	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application.

   ☒ claims Nos. 10, 11.

because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

   ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 10, 11 are so unclear that no meaningful opinion could be formed (*specify*):
   see separate sheet

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the standard.

   ☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventiv step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9, 12-21
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9, 12-21
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9, 12-21
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Ad. section III.:

Independent claims 10 and 11 claim protection for computer programs as such and are thus excluded from international preliminary examination, Rule 67 PCT (see also PCT Gazette - section IV-2.4(f)).
However, these two claims do further not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. Most of the terms used in said claims are vague and unclear and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of claims 10 and 11 unclear. Due to the vague and unclear wording of independent claims 10 and 11 respectively, it is totally unclear for which subject-matter protection is really sought, Article 6 PCT.

As a result, it is at present not possible to carry out a complete and meaningful examination on novelty, inventiveness and industrial applicability of the subject-matter of said independent claims 10 and 11.

Further reasons are given in section VIII.

Ad section V.:

CLAIMS 1, 12

The present application relates to a digital network modem having a modem address configuration system.

The article of Loucks et al. "Implementation of a dynamic address assignment protocol in a LAN", published 1986 in Computer Networks and ISDN Systems, NL, vol. 11, no. 2, pages 133-146, describes an implementation of a dynamic address assignment protocol in a local area network using a name server for automatically assigning addresses to stations when the network is started.

In WO 98/26548, a mechanism is disclosed for an automatic configuration for an Internet access device using static and dynamic addresses.

In the solution proposed by the system and method category of claims 1 and 12 respectively, a configuration station sends a request on a local network to the modem to obtain identification and static IP address from the modem, receives a response from the modem and displays the static IP address, accepts user input to set the static IP address, and sends a request on the local network to the modem to set the static IP address.

This simple configuration concept as defined by the combination of features of claim 1 or 12 respectively, is not to be taken or obviously derived from one of the documents cited in the International Search Report in the sense of Rule 33(1) PCT.

The requirements of Article 33 PCT are therefore fulfilled for independent claims 1 and 12.

CLAIMS 2-9, 13-21

Dependent Claims 2 to 9 and 13 to 21 contain further details of the configuration system of claim 1 or of the initializing method of claim 12 respectively. As they are dependent on these claims, they also satisfy the requirements of Article 33 PCT.

Ad section VII.:

The following formal deficiencies are found in the application:

a) The claims do not meet the requirements of Rule 6.2b PCT in that they do not contain reference signs.
b) Independent claims 1 and 11 do not meet the requirements of Rule 6.3b PCT in that they are not divided in the correct two-part form.

Ad section VIII.:

CLAIMS 10, 11

Independent claims 10 and 11 relate each to a computer program comprising coding means which when loaded into a client station provides the system according to claim 1 and which is either embodied on a computer readable medium (claim 10) or embodied as an electrical signal (claim 11). These two independent claims thus claim each protection for a computer program as such which is recorded on a particular carrier. According to Rule 67 PCT, such computer programs are excluded from international preliminary examination (reference is also made to PCT Gazette - section IV-2.4(f)).

However, the very broadly formulated wording of independent claims 10 and 11 do further not contain all the features being essential for the technical realisation of the claimed subject-matter. The features of claims 10 and 11 respectively, are formulated in such a broad manner that these features are not very instructive for a skilled person wishing to correctly carry out the invention as defined in independent claim 1 and as disclosed throughout the description of the present application.

The computer program of claim 10 is only vaguely defined by comprising any code means to provide a system (how can a program provide a system?), but only in the case when the code means is loaded into a client station. From the broad wording of claim 10, it appears further that the claimed computer program (or something else?) is recorded on a computer readable medium.

In the case of independent claim 11, a similar computer program as in claim 10 is claimed, but with the difference of the prgram being embodied as an electrical or electro-magnetical signal (?).

No particular structural features, neither specific functional terms of the claimed computer program of claim 10, of claim 11 have been defined by the very broadly and unclear wording of present independent claims 10 and 11 respectively, so

that neither the exact meaning of the technical features involved iis clear, nor the interrelationship between these features.
These unclear formulations lead further to doubt concerning the matter for which protection is really sought, thereby rendering the claims unclear (Article 6 PCT).

Hence, independent claims 10 and 11 lack clarity, Article 6 PCT.

such networks. While computer networks were very uncommon a few years ago for home users, it is now economically feasible and desirable to interconnect computer devices in a home environment. Any simplification of the task of network management is important from the perspective of both increased reliability and reduced training for the network manager.

The article by Loucks W M et al entitled "Implementation Of A Dynamic Address Assignment Protocol In A Local Area Network" and published in 1986 describes an implementation of a dynamic address assignment protocol in a local area network using a nameserver for automatically assigning addresses to stations when the network is started.

An international patent application number WO 98 26548 to Archie L Cobbs and Jim Y Li describes a mechanism for an automatic configuration for an Internet access device using static and dynamic addresses.

Summary of the Invention

It is an object of the invention to provide in a digital network modem a mechanism for initializing a static IP address for the modem on the LAN via communication with a configuration station on the LAN.

According to the invention a network modem has an initialization control module for setting its static IP address remotely via the local network in response to a request by a configuration station. The configuration station sends a request on the local network to the modem to obtain identification and static IP address from the modem, receives a response from the modem and displays the static IP address , accepts user input to set the static IP address, and sends a request on the local network to the modem to set the static IP address. The system allows a user to set the static IP address for the modem, configure the modem settings, as well as the settings for the station. The system is easy to use and can work even if initial modem and configuration station communications parameters are incompatible.

The invention thus provides a network modem device configuration system connected to a modem via a local network, the system comprising a first module sending a request on the local network to the modem to obtain identification and static IP address from the modem, a second module receiving a response from the modem and displaying the static IP address, a third module accepting user input

to set the static IP address, and a fourth module sending a request on the local network to the modem to set the static address. Preferably, the system further comprises a fifth module testing the static address on the network and, when the testing fails to validate operation of the static address for the modem, one of displaying an error message and prompting the user to input new data for the static address. Preferably, the first module sends a broadcast discover message on the local network to the modem on a specific IP port to solicit a response identifying the modem, the second module receives and decodes a response from the modem to obtain the identification and static IP address, and the fourth module broadcasts on the local network to the modem a message including the identification of the modem and an identification of the set static address.

Preferably, the system also comprises a parameter setting interface system allowing modem parameters to be set at the configuration system. The parameter setting interface system may include a save and restore mechanism allowing the modem parameters to be saved in storage external from the modem and restored to the modem from the storage. The parameter setting interface system is preferably provided by a web browser displaying pages requested from the modem, and the system advantageously comprises a sixth module for launching the web browser with an HTTP request addressed to the static address.

The configuration system according to the invention may be provided by software running in a client station connected to the local network. Therefore, the invention also provides a computer program product, as well as a method of transmitting a data signal which comprises a computer program executable in the client station for providing the configuration system according to the invention.

According to a further aspect of the present invention, there is provided a method for initializing a static IP address of a network modem device on a local network, comprising the steps of : broadcasting a request from a configuration station onto the local network; receiving a response to the request at the configuration station from the network modem device comprising an identification for the network modem device, the identification comprising at least an IP address for the network modem device; verifying a compatibility of the identification with settings for the local network; if the identification is compatible with the settings, send a confirmation message with the identification to the network modem device and receive a confirmation response from the network modem device; if the identification is not compatible with the settings, send a new address message

comprising a new IP address for the network modem device, receive a change of IP response from the network modem device, send a new address confirmation message with the new IP address to the network modem device and receive a new address confirmation response from the network modem device.

All aspects of the invention can be provided as computer code means which carried out the steps of the methods or which embody the system once loaded in the client computer, the computer code means being embodied either as a computer readable medium or as an electrical or electro-magnetical signal.

Brief Description of the Drawings

The invention will be better understood by way of the following detailed description of a preferred embodiment with reference to the appended drawings, in which:

Fig. 1 is a schematic block diagram of the LAN ISDN modem according to the preferred embodiment connected to a LAN to which a configuration station and a network DHCP server are also connected; and

Fig. 2 is a flow chart illustrating the steps following in configuring and installing the modem using a configuration station.

Detailed Description of the Preferred Embodiment

As illustrated in Fig. 1, the digital modem 10 according to the preferred embodiment is an ISDN modem having a plurality of functional components shown in Fig. 1. The separation of components illustrated in the separate blocks in Fig. 1 is for the purposes of illustration only, and does not necessarily reflect the physical separation of components in the real device which is built from both hardware and software/firmware components.

In accordance with the present invention, the modem 10 may be installed in the network environment by assigning it an IP address either by direct connection or via the network. The address initializer module 14 provided in modem 10 communicates both with LAN interface 12 and a serial port in communication

CLAIMS

1. A network modem device configuration system connected to a modem via a local network, the system comprising

a first module sending a request on said local network to said modem to obtain identification and static IP address data from said modem,

a second module receiving a response from said modem and displaying said static IP address,

a third module accepting user input to set said static IP address, and

a fourth module sending a request on said local network to said modem to set said static IP address.

2. The system according to claim 1, further comprising a fifth module testing said static address on said network and, when said testing fails to validate operation of said static address for said modem, preventing said fourth module from sending the request on said local network to said modem to set said static IP address, and one of displaying an error message and prompting said user to input new data for said static address.

3. The system according to claim 1 or 2, wherein said first module sends a broadcast discover message on said local network to said modem to solicit a response identifying said modem, said second module receiving and decoding a response from said modem to obtain said identification and static IP address, and said fourth module broadcasts on said local network to said modem a message including said identification of said modem and an identification of said set static address.

4. The system according to claim 2 or 3, wherein said broadcast message sent by said first and fourth modules, and received by said second module is transmitted on a proprietary port.

5. The system according to any one of claims 1 to 4, further comprising a parameter setting interface system allowing modem parameters to be set at said configuration system.

6. The system according to claim 5, wherein said parameter setting interface system includes a save and restore mechanism allowing said modem parameters to be saved in storage external from said modem and restored to said modem from said storage.

7. The system according to claim 5 or 6, wherein said parameter setting interface system is provided by a web browser displaying pages requested from said modem, said system further comprising a sixth module for launching said web browser with an HTTP request addressed to said static address.

8. The system according to claim 5, 6 or 7, wherein said modem is an ISDN modem, said modem parameters are selected from said group consisting of DHCP configuration settings, DNS settings, and ISDN connection settings.

9. The system according to any one of claims 1 to 8, wherein said system is a client station, further comprising a seventh module allowing a network configuration of said station to be set in consideration of changes to said local network due to an addition of said modem to said local network.

10. A computer program comprising code means which when loaded into said client station provides said system according to any one of claims 1 to 9, embodied on a computer readable medium.

11. A computer program comprising code means which when loaded into a client station provides the system according t any one of claims 1 to 9, embodied as an electrical or electro-magnetical signal.

12. A method for initializing a static IP address of a network modem device on a local network, comprising the steps of :

broadcasting a request from a configuration station onto said local network;

receiving a response to said request at said configuration station from said network modem device comprising an identification for said network modem device, said identification comprising at least an IP address for said network modem device;

verifying a compatibility of said identification with settings for said local network;

if said identification is compatible with said settings, send a confirmation message with said identification to said network modem device and receive a confirmation response from said network modem device;

if said identification is not compatible with said settings, send a new address message comprising a new IP address for said network modem device, receive a change of IP response from said network modem device, send a new address confirmation message with said new IP address to said network modem device and receive a new address confirmation response from said network modem device.

13. The method according to claim 12, wherein said request by said configuration station comprises a broadcast message, and said identification comprises an IP address, a MAC address and an internal DHCP server status for said network modem device.

14. The method according to claim 13, wherein said messages from said configuration station and said responses from said modem are sent on a proprietary port.

15. The method according to claim 13 or 14, wherein said modem further comprises an integrated DHCP server, and said message sent from said modem further includes an activation status of said DHCP server.

16. The method according to claim 15, wherein said modem automatically detects a presence of a network DHCP server on said local network and disables said integrated DHCP server when a network DHCP server is present on said local network.

17. The method according to any one of claims 12 to 16, wherein said device is a digital network modem.

18. The method according to claim 17, wherein said device is an ISDN modem.

19. The method according to any one of claims 12 to 18, further comprising a parameter setting interface system allowing modem parameters to be set by remote connection via said local network.

20. The method according to claim 19, wherein said interface system is provided by a web host mechanism.

21. The method according to claim 20, wherein said web host mechanism provides for saving said modem parameters to, and restoring said modem parameters from, said remote connection.

PATENT COOPERATION TREATY

PCT

REC'D 30 JAN 2001
WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
13693-7pctJA		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CA99/01013	29/10/1999	30/10/1998
International Patent Classification (IPC) or national classification and IPC H04L29/12		
Applicant EICON TECHNOLOGY CORPORATION et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 7 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
29/05/2000	25. 01. 01
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ferrari, J Telephone No. +49 89 2399 8803

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA99/01013

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:
Description, pages:

1,2,6-9	as originally filed			
3-5	as received on	05/01/2001	with letter of	04/01/2001

Claims, No.:

1-21	as received on	05/01/2001	with letter of	04/01/2001

Drawings, sheets:

1/2,2/2	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application.

   ☒ claims Nos. 10, 11.

because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

   ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 10, 11 are so unclear that no meaningful opinion could be formed (*specify*):
   see separate sheet

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the standard.

   ☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9, 12-21
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9, 12-21
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9, 12-21
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Ad. section III.:

Independent claims 10 and 11 claim protection for computer programs as such and are thus excluded from international preliminary examination, Rule 67 PCT (see also PCT Gazette - section IV-2.4(f)).
However, these two claims do further not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. Most of the terms used in said claims are vague and unclear and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of claims 10 and 11 unclear. Due to the vague and unclear wording of independent claims 10 and 11 respectively, it is totally unclear for which subject-matter protection is really sought, Article 6 PCT.

As a result, it is at present not possible to carry out a complete and meaningful examination on novelty, inventiveness and industrial applicability of the subject-matter of said independent claims 10 and 11.

Further reasons are given in section VIII.

Ad section V.:

CLAIMS 1, 12

The present application relates to a digital network modem having a modem address configuration system.

The article of Loucks et al. "Implementation of a dynamic address assignment protocol in a LAN", published 1986 in Computer Networks and ISDN Systems, NL, vol. 11, no. 2, pages 133-146, describes an implementation of a dynamic address assignment protocol in a local area network using a name server for automatically assigning addresses to stations when the network is started.

In WO 98/26548, a mechanism is disclosed for an automatic configuration for an Internet access device using static and dynamic addresses.

In the solution proposed by the system and method category of claims 1 and 12 respectively, a configuration station sends a request on a local network to the modem to obtain identification and static IP address from the modem, receives a response from the modem and displays the static IP address, accepts user input to set the static IP address, and sends a request on the local network to the modem to set the static IP address.

This simple configuration concept as defined by the combination of features of claim 1 or 12 respectively, is not to be taken or obviously derived from one of the documents cited in the International Search Report in the sense of Rule 33(1) PCT.

The requirements of Article 33 PCT are therefore fulfilled for independent claims 1 and 12.

CLAIMS 2-9, 13-21

Dependent Claims 2 to 9 and 13 to 21 contain further details of the configuration system of claim 1 or of the initializing method of claim 12 respectively. As they are dependent on these claims, they also satisfy the requirements of Article 33 PCT.

Ad section VII.:

The following formal deficiencies are found in the application:

a) The claims do not meet the requirements of Rule 6.2b PCT in that they do not contain reference signs.
b) Independent claims 1 and 11 do not meet the requirements of Rule 6.3b PCT in that they are not divided in the correct two-part form.

Ad section VIII.:

CLAIMS 10, 11

Independent claims 10 and 11 relate each to a computer program comprising coding means which when loaded into a client station provides the system according to claim 1 and which is either embodied on a computer readable medium (claim 10) or embodied as an electrical signal (claim 11). These two independent claims thus claim each protection for a computer program as such which is recorded on a particular carrier. According to Rule 67 PCT, such computer programs are excluded from international preliminary examination (reference is also made to PCT Gazette - section IV-2.4(f)).

However, the very broadly formulated wording of independent claims 10 and 11 do further not contain all the features being essential for the technical realisation of the claimed subject-matter. The features of claims 10 and 11 respectively, are formulated in such a broad manner that these features are not very instructive for a skilled person wishing to correctly carry out the invention as defined in independent claim 1 and as disclosed throughout the description of the present application.

The computer program of claim 10 is only vaguely defined by comprising any code means to provide a system (how can a program provide a system?), but only in the case when the code means is loaded into a client station. From the broad wording of claim 10, it appears further that the claimed computer program (or something else?) is recorded on a computer readable medium.

In the case of independent claim 11, a similar computer program as in claim 10 is claimed, but with the difference of the prgram being embodied as an electrical or electro-magnetical signal (?).

No particular structural features, neither specific functional terms of the claimed computer program of claim 10, of claim 11 have been defined by the very broadly and unclear wording of present independent claims 10 and 11 respectively, so

that neither the exact meaning of the technical features involved iis clear, nor the interrelationship between these features.
These unclear formulations lead further to doubt concerning the matter for which protection is really sought, thereby rendering the claims unclear (Article 6 PCT).

Hence, independent claims 10 and 11 lack clarity, Article 6 PCT.

REPLACED BY ART 34 AMDT

such networks. While computer networks were very uncommon a few years ago for home users, it is now economically feasible and desirable to interconnect computer devices in a home environment. Any simplification of the task of network management is important from the perspective of both increased reliability and reduced training for the network manager.

Summary of the Invention

It is an object of the invention to provide in a digital network modem a mechanism for initializing a static IP address for the modem on the LAN via communication with a configuration station on the LAN.

According to the invention a network modem has an initialization control module for setting its static IP address remotely via the local network in response to a request by a configuration station. The configuration station sends a request on the local network to the modem to obtain identification and static IP address from the modem, receives a response from the modem and displays the static IP address , accepts user input to set the static IP address, and sends a request on the local network to the modem to set the static IP address. The system allows a user to set the static IP address for the modem, configure the modem settings, as well as the settings for the station. The system is easy to use and can work even if initial modem and configuration station communications parameters are incompatible.

The invention thus provides a network modem device configuration system connected to a modem via a local network, the system comprising a first module sending a request on the local network to the modem to obtain identification and static IP address from the modem, a second module receiving a response from the modem and displaying the static IP address, a third module accepting user input to set the static IP address, and a fourth module sending a

request on the local network to the modem to set the static address. Preferably, the system further comprises a fifth module testing the static address on the network and, when the testing fails to validate operation of the static address for the modem, one of displaying an error message and prompting the user to input new data for the static address. Preferably, the first module sends a broadcast discover message on the local network to the modem on a specific IP port to solicit a response identifying the modem, the second module receives and decodes a response from the modem to obtain the identification and static IP address, and the fourth module broadcasts on the local network to the modem a message including the identification of the modem and an identification of the set static address.

Preferably, the system also comprises a parameter setting interface system allowing modem parameters to be set at the configuration system. The parameter setting interface system may include a save and restore mechanism allowing the modem parameters to be saved in storage external from the modem and restored to the modem from the storage. The parameter setting interface system is preferably provided by a web browser displaying pages requested from the modem, and the system advantageously comprises a sixth module for launching the web browser with an HTTP request addressed to the static address.

The configuration system according to the invention may be provided by software running in a client station connected to the local network. Therefore, the invention also provides a computer program product, as well as a method of transmitting a data signal which comprises a computer program executable in the client station for providing the configuration system according to the invention.

According to the invention, there is also provided a network modem device comprising a mechanism for initializing a static address of the device on a local network, the device being characterized in that the mechanism communicates via the local network and is responsive to a request by a configuration station on the local network to provide modem setting data to, and accept setting information from, the configuration station to change said static address.

Brief Description of the Drawings

The invention will be better understood by way of the following detailed description of a preferred embodiment with reference to the appended drawings, in which:

Fig. 1 is a schematic block diagram of the LAN ISDN modem according to the preferred embodiment connected to a LAN to which a configuration station and a network DHCP server are also connected; and

Fig. 2 is a flow chart illustrating the steps following in configuring and installing the modem using a configuration station.

Detailed Description of the Preferred Embodiment

As illustrated in Fig. 1, the digital modem 10 according to the preferred embodiment is an ISDN modem having a plurality of functional components shown in Fig. 1. The separation of components illustrated in the separate blocks in Fig. 1 is for the purposes of illustration only, and does not necessarily reflect the physical separation of components in the real device which is built from both hardware and software/firmware components.

In accordance with the present invention, the modem 10 may be installed in the network environment by assigning it an IP address either by direct connection or via the network. The address initializer module 14 provided in modem 10 communicates both with LAN interface 12 and a serial port in communication

CLAIMS

1. A network modem device comprising a mechanism for initializing a static IP address of the device on a local network, the device being characterized in that the mechanism communicates via the local network and is responsive to a request by a configuration station on the local network to provide modem setting data to, and accept setting information from, the configuration station to change said static address.

2. The device according to claim 1, wherein said request by the configuration station comprises a broadcast message, and said initialization mechanism responds with a broadcast message including an identification of said device and a current value for said static address.

3. The device according to claim 2, wherein said broadcast message from the configuration station and from the modem is sent on a proprietary port.

4. The device according to claim 2 or 3, wherein said modem further comprises an integrated DHCP server, and said broadcast message sent from the modem further includes an activation status of said DHCP server.

5. The device according to claim 4, wherein said modem automatically detects a presence of a network DHCP server on the local network and disables said integrated DHCP server when a network DHCP server is present on the local network.

6. The device according to any one of claims 1 to 5, wherein said device is a digital network modem.

7. The device according to claim 6, wherein said device is an ISDN modem.

8. The device according to any one of claims 1 to 7, further comprising a parameter setting interface system allowing modem parameters to be set by remote connection via the local network.

9. The device according to claim 8, wherein said interface system is provided by a web host mechanism.

10. The device according to claim 9, wherein the web host mechanism provides for saving said modem parameters to, and restoring said modem parameters from, the remote connection.

11. A network modem device configuration system connected to a modem via a local network, the system comprising a first module sending a request on the local network to the modem to obtain identification and static IP address data from the modem, a second module receiving a response from the modem and displaying said static IP address, a third module accepting user input to set said static IP address, and a fourth module sending a request on the local network to the modem to set said static IP address.

12. The system according to claim 11, further comprising a fifth module testing said static address on said network and, when said testing fails to validate operation of said static address for said modem, preventing said fourth module from sending the request on the local network to the modem to set said static IP address, and one of displaying an error message and prompting said user to input new data for said static address.

13. The system according to claim 11 or 12, wherein said first module sends a broadcast discover message on the local network to the modem to solicit a response identifying the modem, said second module receiving and decoding a response from the modem to obtain said identification and static IP address, and said fourth module broadcasts on the local network to the modem a message including said identification of the modem and an identification of the set static address.

14. The system according to claim 12 or 13, wherein said broadcast message sent by said first and fourth modules, and received by said second module is transmitted on a proprietary port.

15. The system according to any one of claims 11 to 14, further comprising a parameter setting interface system allowing modem parameters to be set at the configuration system.

16. The system according to claim 15, wherein the parameter setting interface system includes a save and restore mechanism allowing said modem parameters to be saved in storage external from the modem and restored to the modem from said storage.

17. The system according to claim 15 or 16, wherein the parameter setting interface system is provided by a web browser displaying pages requested from the modem, said system further comprising a sixth module for launching the web browser with an HTTP request addressed to said static address.

18. The system according to claim 15, 16 or 17, wherein said modem is an ISDN modem, said modem parameters are selected from the group consisting of DHCP configuration settings, DNS settings, and ISDN connection settings.

19. The system according to any one of claims 11 to 18, wherein said system is a client station, further comprising a seventh module allowing a network configuration of said station to be set in consideration of changes to said local network due to an addition of said modem to said local network.

20. A computer program product for a client station having communications capability with a local network, said product comprising a computer readable medium having recorded program data, which when loaded into the client station provides the system according to any one of claims 11 to 19.

21. A method of transmitting a data signal to a client station having communications capability with a local network, wherein said data signal when loaded into the client station provides the system according to any one of claims 11 to 19.

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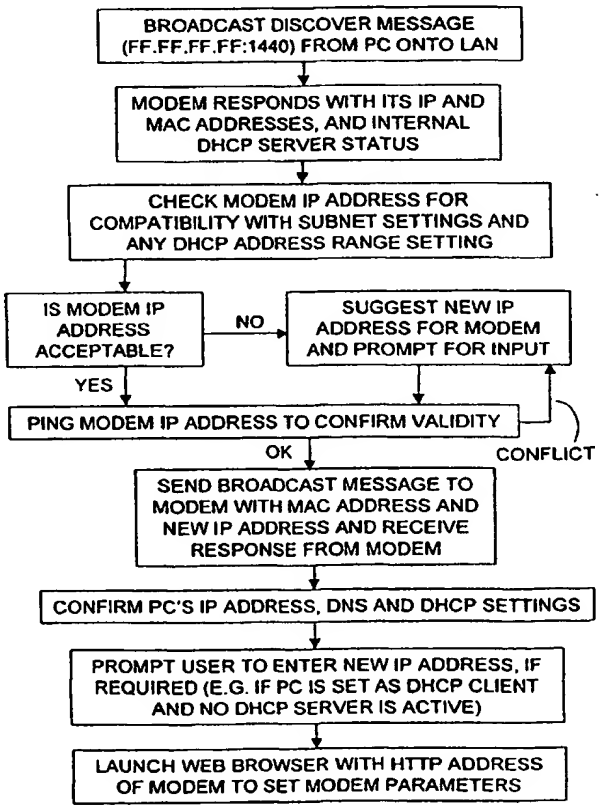
(54) Title: DIGITAL NETWORK MODEM AND CONFIGURATION SYSTEM FOR A DIGITAL NETWORK MODEM

(57) Abstract

A network modem has an initialization control module for setting its static local network address remotely via the local network in response to a request by a configuration station. The configuration station sends a request on the local network to the modem to obtain identification and a static IP address from the modem, receives a response from the modem and displays the static IP address, accepts user input to set said static IP address, and sends a request on the local network to the modem to set said static address. The system allows a user to set the static IP address for the modem, configure the modem settings, as well as the settings for the station. The system is easy to use and can work even if initial modem and configuration station communications parameters are incompatible.



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DIGITAL NETWORK MODEM AND CONFIGURATION SYSTEM FOR A DIGITAL NETWORK MODEM

Field of the Invention

The present invention relates to a digital network modem, such as an ISDN or a DSL modem, and more particularly to a digital network modem having a modem address configuration system.

Background of the Invention

When installing new equipment to be connected to a network, such as a local area network (LAN), it is necessary to assign an (Internet protocol) IP network address to the new equipment, and a variety of methods for doing so are used. The most basic form of address management is to manually assign an IP address to the new equipment by directly setting or programming the network address at the new equipment using knowledge (i.e. a list) of IP addresses already used on the network, so as to be able to select a new and available address. The network manager or administrator is thus the "keeper" of the list of used addresses, and he or she is required to install any new equipment on the network. It is also common for the equipment to have a factory set IP address, and for the network administrator to use the factory address if it is within the range of usable addresses on the network, and it is not already assigned to a different device. If the factory set address is not compatible with the range of addresses used on the LAN, it is necessary to change the IP address of the new equipment.

To change the static IP address of new equipment to be compatible with the LAN requires an input interface. It is known to use a communications interface on the equipment to which a console can be connected to provide the input interface, and it is also known to use DIP switches on the equipment for setting

the static address. These options either require considerable effort and/or extra equipment.

To facilitate the management of IP addresses in local area networks (LANs), it is known to provide servers called dynamic host configuration protocol or DHCP servers. These servers respond to requests from clients connected to the network to receive assigned dynamic IP addresses for communication purposes on the network. The advantage of using such a dynamic IP address assignment is that new clients can be added easily, and the effort to manage the addresses used on the network is reduced. In most cases, a DHCP server is provided by software added to a network server.

While DHCP can be adapted for use in assigning static IP addresses, it is often preferred to allow only the network administrator the ability to assign static addresses. Static IP addresses are required by certain types of equipment, usually network resource equipment, such as modems or servers.

When a network which was previously not connected to other networks or when a network needs a faster or additional connection to other networks, digital network modems are added to provide the desired connection. Network modems, such as ISDN modems, are assigned a static IP address on the LAN. When a DHCP server is provided on the LAN, clients on the LAN are assigned their IP addresses and can recognize the modem as a router or gateway by consulting the DHCP, and in this way, each client does not need to have prior knowledge of any fixed IP address for the modem.

Computer networks are being installed in more and more residential, office and industrial environments, and the increase in the number of such networks has increased the need for skilled technicians required to configure and maintain

such networks. While computer networks were very uncommon a few years ago for home users, it is now economically feasible and desirable to interconnect computer devices in a home environment. Any simplification of the task of network management is important from the perspective of both increased reliability and reduced training for the network manager.

Summary of the Invention

It is an object of the invention to provide in a digital network modem a mechanism for initializing a static IP address for the modem on the LAN via communication with a configuration station on the LAN.

According to the invention a network modem has an initialization control module for setting its static IP address remotely via the local network in response to a request by a configuration station. The configuration station sends a request on the local network to the modem to obtain identification and static IP address from the modem, receives a response from the modem and displays the static IP address , accepts user input to set the static IP address, and sends a request on the local network to the modem to set the static IP address. The system allows a user to set the static IP address for the modem, configure the modem settings, as well as the settings for the station. The system is easy to use and can work even if initial modem and configuration station communications parameters are incompatible.

The invention thus provides a network modem device configuration system connected to a modem via a local network, the system comprising a first module sending a request on the local network to the modem to obtain identification and static IP address from the modem, a second module receiving a response from the modem and displaying the static IP address, a third module accepting user input to set the static IP address, and a fourth module sending a

request on the local network to the modem to set the static address. Preferably, the system further comprises a fifth module testing the static address on the network and, when the testing fails to validate operation of the static address for the modem, one of displaying an error message and prompting the user to input new data for the static address. Preferably, the first module sends a broadcast discover message on the local network to the modem on a specific IP port to solicit a response identifying the modem, the second module receives and decodes a response from the modem to obtain the identification and static IP address, and the fourth module broadcasts on the local network to the modem a message including the identification of the modem and an identification of the set static address.

Preferably, the system also comprises a parameter setting interface system allowing modem parameters to be set at the configuration system. The parameter setting interface system may include a save and restore mechanism allowing the modem parameters to be saved in storage external from the modem and restored to the modem from the storage. The parameter setting interface system is preferably provided by a web browser displaying pages requested from the modem, and the system advantageously comprises a sixth module for launching the web browser with an HTTP request addressed to the static address.

The configuration system according to the invention may be provided by software running in a client station connected to the local network. Therefore, the invention also provides a computer program product, as well as a method of transmitting a data signal which comprises a computer program executable in the client station for providing the configuration system according to the invention.

According to the invention, there is also provided a network modem device comprising a mechanism for initializing a static address of the device on a local network, the device being characterized in that the mechanism communicates via the local network and is responsive to a request by a configuration station on the local network to provide modem setting data to, and accept setting information from, the configuration station to change said static address.

Brief Description of the Drawings

The invention will be better understood by way of the following detailed description of a preferred embodiment with reference to the appended drawings, in which:

Fig. 1 is a schematic block diagram of the LAN ISDN modem according to the preferred embodiment connected to a LAN to which a configuration station and a network DHCP server are also connected; and

Fig. 2 is a flow chart illustrating the steps following in configuring and installing the modem using a configuration station.

Detailed Description of the Preferred Embodiment

As illustrated in Fig. 1, the digital modem 10 according to the preferred embodiment is an ISDN modem having a plurality of functional components shown in Fig. 1. The separation of components illustrated in the separate blocks in Fig. 1 is for the purposes of illustration only, and does not necessarily reflect the physical separation of components in the real device which is built from both hardware and software/firmware components.

In accordance with the present invention, the modem 10 may be installed in the network environment by assigning it an IP address either by direct connection or via the network. The address initializer module 14 provided in modem 10 communicates both with LAN interface 12 and a serial port in communication

with a console 15. The console 15 may be provided by a PC running a terminal program. The modem is preferably provided with a factory IP address (192.168.1.1) which is first tried. If the factory installed address is not usable, the following mechanism is used to install the modem 10 on the existing network where the IP addresses are already defined. In the prior art, the network IP address for the modem was communicated to the modem by using a console connected to the modem by a serial port, and thus the IP address for the modem was not set through the network (it is also known in the art to allow the IP address to be set in the factory, by keyboard input or by DIP switches).

The modem 10 must have a static IP address (i.e. a dynamic address from either DHCP server 28 or 16 is not to be used), and configuration station 24 is used in configuring the IP address for the modem 10 via the LAN 22. The configuration station 24 may have a static IP address or it may be a DHCP client and have a dynamic IP address. A system tray or modem monitor program 26 in the configuration station is used to assign modem 10 its static IP address.

In the preferred embodiment, modem 10 communicates with configuration station 24 either using HTML pages and an IP connection, or using menus with a terminal connection via LAN 22 or console 15.

As illustrated in Fig. 2, the steps involved in configuring modem 10 in the preferred embodiment can be described as follows. The modem 10 is connected to LAN 22 and powered on. The modem has a factory set static IP address, and initializer 14 is able to communicate either with station 24 or console 15 to receive a command to change its address. When the address change is done using the station 24, the modem monitor 26 is used to determine, confirm and

set the static IP address in the modem 10 by communicating via LAN 22 with the initializer 14.

To communicate with modem 10 initially, the system tray 26 discovers the modem 10 by sending a broadcast packet on a predetermined proprietary port 1440. If modem 10 and the configuration station 24 are not on the same sub-net, the system tray 26 can ask modem 10 to change its address to be on the same sub-net. The system tray 26 thus sends a proprietary discovery user datagram protocol (UDP) broadcast message to a predetermined port, (e.g. the port chosen in the preferred embodiment is 1440, and thus the address is FF.FF.FF.FF:1440), which broadcast message is detected by initializer 14. In response to the broadcast, initializer 14 sends a reply broadcast message to port 1440, namely to address FF.FF.FF.FF:1440, including the MAC address of modem 10 in the packet. The modem monitor 26 then sends a broadcast packet to port 1440 including in the packet the MAC address of modem 10 along with the static IP address to be used. Initializer 14 recognizes its own MAC address in the packet broadcast from the system tray 26 and sets the IP address for the modem 10 to the address contained in the packet.

In selecting the IP address for modem 10, the configuration station is equipped with software, namely utility programs called Wizards, to help the user of station 24 install modem 10 by finding an available address for modem 10 on network 22. Such programs provide a list of all used static addresses, as well as the range of addresses reserved for dynamic allocation. The address for modem 10 must also be identified as a gateway or router and, in the preferred embodiment, as a domain name server (DNS) since modem 10 includes a DNS relay module 19. The system tray 26 has an interface allowing the network manager to enter an appropriate static IP address for the modem. The static address should be outside the range of DHCP addresses, or it should otherwise

be reserved as a static address. If station 24 is a DHCP client and get its address from DHCP Server 16, the modem IP address can be assumed to be correct. However, in all cases, a ping message is sent by station 24 to the defined IP address before setting the modem's IP address to ensure that it is unique and valid. At this stage, the entered static IP address is validated.

The configuration station 24 may also require to have its network setting adjusted as a result of the installation of the modem onto the LAN 22. As illustrated in Fig. 2, when the station 24 is a DHCP client, and there is no DHCP server, it is necessary to enter a static address of the station 24, and the modem monitor 26 provides this interface. Likewise, changes to the DHCP status, DNS and subnet parameters, which are caused by the introduction of the modem 10 can be set using the settings interface provided by the modem monitor 26. The modem monitor can also obtain information about the network, such as the status of DHCP servers on the network, by requesting the modem 10 to carry out communications task on the LAN 22, which the station 24, configured conventionally, can have difficulty carrying out itself. In this way, the modem 10 is used as a network resource for helping the modem monitor 26 perform its functions.

Once the static address has been confirmed, the modem monitor launches a web-based configuration interface for allowing the network administrator to set the modem parameters. The web-based interface, namely a web browser, is launched to automatically initiate an HTTP request to the validated IP address of the modem. The modem parameters include the ISDN numbers, connection time parameters, external DNS addresses, activation of the internal DNS caching and listing functions, editing of the modem's DNS list, DHCP parameters for the built-in DHCP server 16, password data, etc. These parameters can optionally be saved at station 24 for back-up purposes, and the

modem web-based configuration interface allows for both saving of these parameter to storage at station 24 as well as restoring of the parameters from storage at station 24.

CLAIMS

1. A network modem device comprising a mechanism for initializing a static IP address of the device on a local network, the device being characterized in that the mechanism communicates via the local network and is responsive to a request by a configuration station on the local network to provide modem setting data to, and accept setting information from, the configuration station to change said static address.

2. The device according to claim 1, wherein said request by the configuration station comprises a broadcast message, and said initialization mechanism responds with a broadcast message including an identification of said device and a current value for said static address.

3. The device according to claim 2, wherein said broadcast message from the configuration station and from the modem is sent on a proprietary port.

4. The device according to claim 2 or 3, wherein said modem further comprises an integrated DHCP server, and said broadcast message sent from the modem further includes an activation status of said DHCP server.

5. The device according to claim 4, wherein said modem automatically detects a presence of a network DHCP server on the local network and disables said integrated DHCP server when a network DHCP server is present on the local network.

6. The device according to any one of claims 1 to 5, wherein said device is a digital network modem.

7. The device according to claim 6, wherein said device is an ISDN modem.

8. The device according to any one of claims 1 to 7, further comprising a parameter setting interface system allowing modem parameters to be set by remote connection via the local network.

9. The device according to claim 8, wherein said interface system is provided by a web host mechanism.

10. The device according to claim 9, wherein the web host mechanism provides for saving said modem parameters to, and restoring said modem parameters from, the remote connection.

11. A network modem device configuration system connected to a modem via a local network, the system comprising a first module sending a request on the local network to the modem to obtain identification and static IP address data from the modem, a second module receiving a response from the modem and displaying said static IP address, a third module accepting user input to set said static IP address, and a fourth module sending a request on the local network to the modem to set said static IP address.

12. The system according to claim 11, further comprising a fifth module testing said static address on said network and, when said testing fails to validate operation of said static address for said modem, preventing said fourth module from sending the request on the local network to the modem to set said static IP address, and one of displaying an error message and prompting said user to input new data for said static address.

13. The system according to claim 11 or 12, wherein said first module sends a broadcast discover message on the local network to the modem to solicit a response identifying the modem, said second module receiving and decoding a response from the modem to obtain said identification and static IP address, and said fourth module broadcasts on the local network to the modem a message including said identification of the modem and an identification of the set static address.

14. The system according to claim 12 or 13, wherein said broadcast message sent by said first and fourth modules, and received by said second module is transmitted on a proprietary port.

15. The system according to any one of claims 11 to 14, further comprising a parameter setting interface system allowing modem parameters to be set at the configuration system.

16. The system according to claim 15, wherein the parameter setting interface system includes a save and restore mechanism allowing said modem parameters to be saved in storage external from the modem and restored to the modem from said storage.

17. The system according to claim 15 or 16, wherein the parameter setting interface system is provided by a web browser displaying pages requested from the modem, said system further comprising a sixth module for launching the web browser with an HTTP request addressed to said static address.

18. The system according to claim 15, 16 or 17, wherein said modem is an ISDN modem, said modem parameters are selected from the group consisting of DHCP configuration settings, DNS settings, and ISDN connection settings.

19. The system according to any one of claims 11 to 18, wherein said system is a client station, further comprising a seventh module allowing a network configuration of said station to be set in consideration of changes to said local network due to an addition of said modem to said local network.

20. A computer program product for a client station having communications capability with a local network, said product comprising a computer readable medium having recorded program data, which when loaded into the client station provides the system according to any one of claims 11 to 19.

21. A method of transmitting a data signal to a client station having communications capability with a local network, wherein said data signal when loaded into the client station provides the system according to any one of claims 11 to 19.

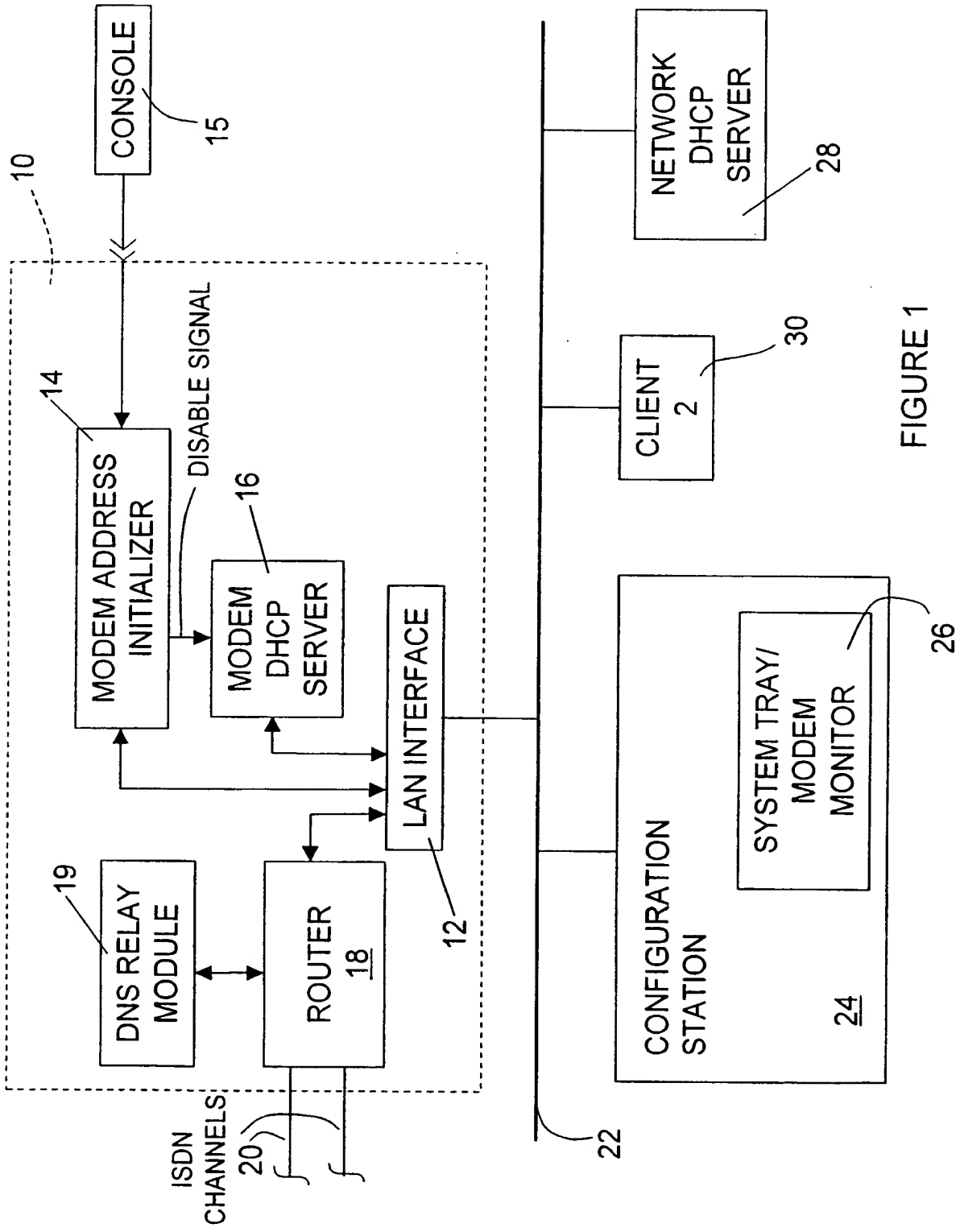
CONSOLE
15
10
NETWORK DHCP SERVER
28
DISABLE SIGNAL
14
MODEM ADDRESS INITIALIZER
16
MODEM DHCP SERVER
CLIENT 2
30
LAN INTERFACE
CONFIGURATION STATION
24
SYSTEM TRAY/ MODEM MONITOR
26
19
DNS RELAY MODULE
ROUTER 18
12
ISDN CHANNELS
20
22

FIGURE 1

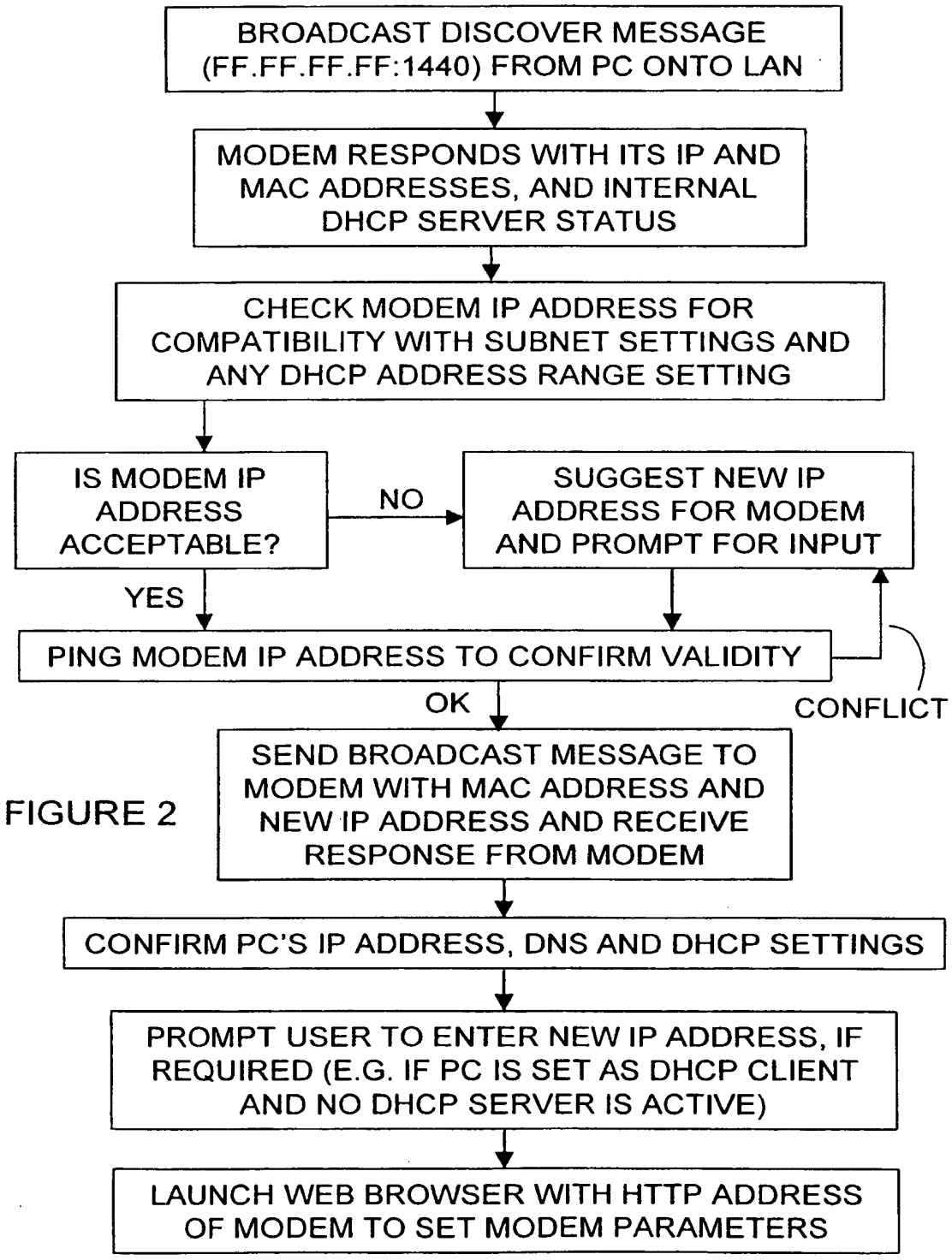
BROADCAST DISCOVER MESSAGE (FF.FF.FF.FF:1440) FROM PC ONTO LAN
MODEM RESPONDS WITH ITS IP AND MAC ADDRESSES, AND INTERNAL DHCP SERVER STATUS
CHECK MODEM IP ADDRESS FOR COMPATIBILITY WITH SUBNET SETTINGS AND ANY DHCP ADDRESS RANGE SETTING
IS MODEM IP ADDRESS ACCEPTABLE?
NO
SUGGEST NEW IP ADDRESS FOR MODEM AND PROMPT FOR INPUT
YES
PING MODEM IP ADDRESS TO CONFIRM VALIDITY
CONFLICT
OK
SEND BROADCAST MESSAGE TO MODEM WITH MAC ADDRESS AND NEW IP ADDRESS AND RECEIVE RESPONSE FROM MODEM
CONFIRM PC'S IP ADDRESS, DNS AND DHCP SETTINGS
PROMPT USER TO ENTER NEW IP ADDRESS, IF REQUIRED (E.G. IF PC IS SET AS DHCP CLIENT AND NO DHCP SERVER IS ACTIVE)
LAUNCH WEB BROWSER WITH HTTP ADDRESS OF MODEM TO SET MODEM PARAMETERS

FIGURE 2

INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA 99/01013

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/12 H04L12/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	LOUCKS W M ET AL: "IMPLEMENTATION OF A DYNAMIC ADDRESS ASSIGNMENT PROTOCOL IN A LOCAL AREA NETWORK" COMPUTER NETWORKS AND ISDN SYSTEMS,NL,NORTH HOLLAND PUBLISHING. AMSTERDAM, vol. 11, no. 2, February 1986 (1986-02), pages 133-146, XP000811184 ISSN: 0169-7552	1-3,6,7, 20,21
A	page 133, right-hand column, line 1 -page 137, left-hand column, line 9 page 141, right-hand column, line 44 -page 143, left-hand column, line 12	11

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
10 March 2000	24/03/2000

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
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A	abstract page 1, line 27 -page 4, line 32 page 6, line 12-15 page 7, line 17 -page 10, line 30 page 11, line 32 -page 12, line 11 page 15, line 17-23 page 17, line 18 -page 20, line 32 figure 6	4,18
A	GOPAL I S ET AL: "DYNAMIC ADDRESS ASSIGNMENT PROTOCOLS" PROCEEDINGS. IEEE INFOCOM, THE CONFERENCE ON COMPUTER COMMUNICATIONS. ANNUAL JOINT CONFERENCE OF THE IEEE COMPUTER AND COMMUNICATIONS SOCIETIES. GATEWAY TO THE 21ST CENTURY,April 1984 (1984-04), XP000811928 page 120, left-hand column, line 1 -page 121, left-hand column, line 29 page 122, right-hand column, line 11-27 figure 2	1,11,20, 21
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INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No
PCT/CA 99/01013

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